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Utility Model Patent Application
No. CN 2328499Y

NOVEL REAMER

Lin Jigong

UNITED STATES PATENT AND TRADEMARK OFFICE
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NATIONAL INTELLECTUAL PROPERTY
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UTILTIY MODEL PATENT APPLICATION NO. CN 2328499Y

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NOVEL REAMER

[Xinxing Jiaodao]

Patentee:	Lin Jigong
Designer:	Lin Jigong

Number of pages of claims:	1
Number of pages of specification:	2
Number of pages of attached figures:	1

Claims

1. A type of novel reamer [sic; screw] characterized by the following facts: the reamer has a reducing structure with variable pitch; the balance blade in the front reamer is ¼-¾ of the screw pitch and is formed into a reducing double-threaded spiral shape; a section of empty region is left in the rear part along the axial direction of the axle sleeve used for fixing the reamer blades in the front reamer; a section of circumferential length is left between the tip of the primary reamer blade to the end of the second reamer blade; the compression cone angle of the front reamer blade is in the range of 10-15°, which matches the cone angle of the head section, and the front reamer blade partially enters the head section.

2. The novel reamer described in Claim 1 characterized by the following facts: the balance blade in the front reamer is ¼-¾ of the screw pitch and is formed into a reducing double-

threaded spiral shape; an empty region of 60-150 mm is left in the rear part along the axial direction of the axle sleeve used for fixing the reamer blades in the front reamer; a circumferential distance of 60-150 mm is left between the tip of the primary reamer blade to the end of the second reamer blade; the compression cone angle of the front reamer blade is in the range of 10-15°, which matches the cone angle of the head section, and the front reamer blade enters the head section by 50-150 mm.

Specification

The present design pertains to the brick extruder manufacturing field.

The present design has the following prior art. The conventional reamer feeds mud flow from the receiving section to the extruding section, extrudes it with the front reamer, and then discharges it from the machine. The conventional reamer has the following problems. 1. The extrusion pressure is nonuniform. The extruded mud strip moves unstably in a snake-like form. 2. Since the entire mud flow is continuous after being extruded by the reamer, a fatal defect occurs: spiral lines that affect the quality of the product 3. The temperature of the head section rises during operation.

The purpose of the present design is to solve the problems of the prior art by providing a type of novel reamer that can stably extrude mud strip and can efficiently eliminate spiral lines.

The scheme of the present design is as follows. (1) When manufacturing the reamer, the axial distance from the rear end of the main reamer blade in the first section to the front end of the reamer blade in the second section is kept in the range of 60-150 mm. The circumferential distance is kept in the range of 60-150 mm, while keeping [the connection] to the spiral of the second section basically smooth. (2) The balance blade is usually ¼-¾, preferably, ½ of the screw pitch and is formed into a double-threaded spiral shape. (3) The section of 50-150 mm at the front of the reamer has a cone angle of 10-15° and enters into the head section. The structure is as follows. For the novel reamer, the balance blade in the front reamer is ¼-¾ of the screw pitch and is formed into a reducing double-threaded spiral shape. A section of empty region is left in the rear part along the axial direction of the axle sleeve used for fixing the reamer blades in the front reamer. A section of circumferential distance is left between the tip of the primary reamer blade to the end of the second reamer blade. The compression cone angle of the front reamer blade is in the range of 10-15°, which matches the cone angle of the head section, and the front reamer blade partially enters the head section. An empty region of 60-150 mm is left in the rear part along the axial direction of the shaft sleeve used for fixing the reamer blades in the front reamer. A circumferential distance of 60-150 mm is left between the tip of the primary reamer blade to the end of the second reamer blade. The compression cone angle of the front reamer blade is in the range of 10-15°, which matches the cone angle of the head section, and the front

reamer blade enters the head section by 50-150 mm. The operating theory is as follows. When mud flow is being fed from the receiving section into the extruding section, before the mud flow enters the extruding section, the direct force applied by the reamer suddenly disappears when the mud flow that is originally formed along a spiral line reaches to the empty region, while the subsequent mud flow keeps coming along with the spiral rotation. As a result, there is friction between the original mud flow and the subsequent mud flow, which destroys the originally formed spiral line. Also, since the reamer rotates continuously, the mud flow with the destroyed spiral line is rapidly extruded by the double-head reamer at the front end and is then discharged from the machine. Therefore, the quality of the obtained base strip is fundamentally improved.

Compared with the prior art, the present design has a new and unique structure and is practical and easy to use. Also, the extruded mud strip is subjected to uniform pressure and has no cracks and can move stably without swinging to the left and right to overcome the snaking problem. In particular, the quality of large hollow vacuum brick base can be improved significantly. In addition, the spiral line defect in the product produced by the background technology can be effectively eliminated.

Brief description of the figures

Figure 1 is a diagram illustrating the solder structure at the front end of the reamer disclosed in the present design.

Figure 2 is a diagram illustrating the structure of the front reamer of the present design.

In the following, the present utility model will be described with reference to Figures 1 and 2.

Application Example 1

(Figures 1 and 2)

The reamer has a reducing structure with variable pitch. The balance blade in the front reamer has a screw pitch of ¼ and is formed into a reducing double-threaded spiral shape (3). An empty region of 60 mm is left in the rear part (1) along the axial direction of the axle sleeve used for fixing the reamer blades in the front reamer. A circumferential distance of 60 mm is left between the tip of the primary reamer blade to the end of the second reamer blade (2). The compression cone angle of the front reamer blade is in the range of 10°, which matches the cone angle of the head section, and the front reamer blade enters the head section by 50 mm.

Application Example 2

(Figures 1 and 2)

The reamer has a reducing structure with variable pitch. The balance blade in the front reamer has a screw pitch of ¾ and is formed into a reducing double-threaded spiral shape (3). An empty region of 150 mm is left in the rear part (1) along the axial direction of the axle sleeve used for fixing the reamer blades in the front reamer. A circumferential distance of 150 mm is left between the tip of the primary reamer blade to the end of the second reamer blade (2). The compression cone angle of the front reamer blade is in the range of 15°, which matches the cone angle of the head section, and the front reamer blade enters the head section by 150 mm.

Application Example 3

(Figures 1 and 2)

The reamer has a reducing structure with variable pitch. The balance blade in the front reamer has a screw pitch of ½ and is formed into a reducing double-threaded spiral shape (3). An empty region of 100 mm is left in the rear part (1) along the axial direction of the axle sleeve used for fixing the reamer blades in the front reamer. A circumferential length of 100 mm is left between the tip of the primary reamer blade to the end of the second reamer blade (2). The compression cone angle of the front reamer blade is in the range of 12°40', which matches the cone angle of the head section, and the front reamer blade enters the head section by 100 mm.

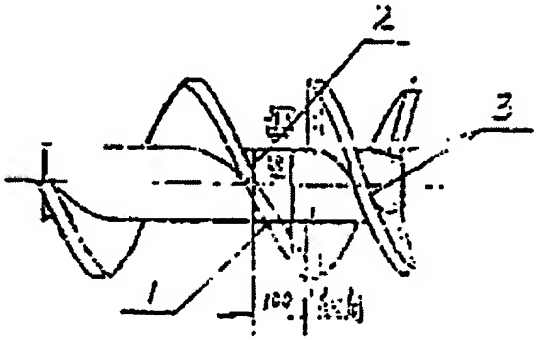

Figure 1

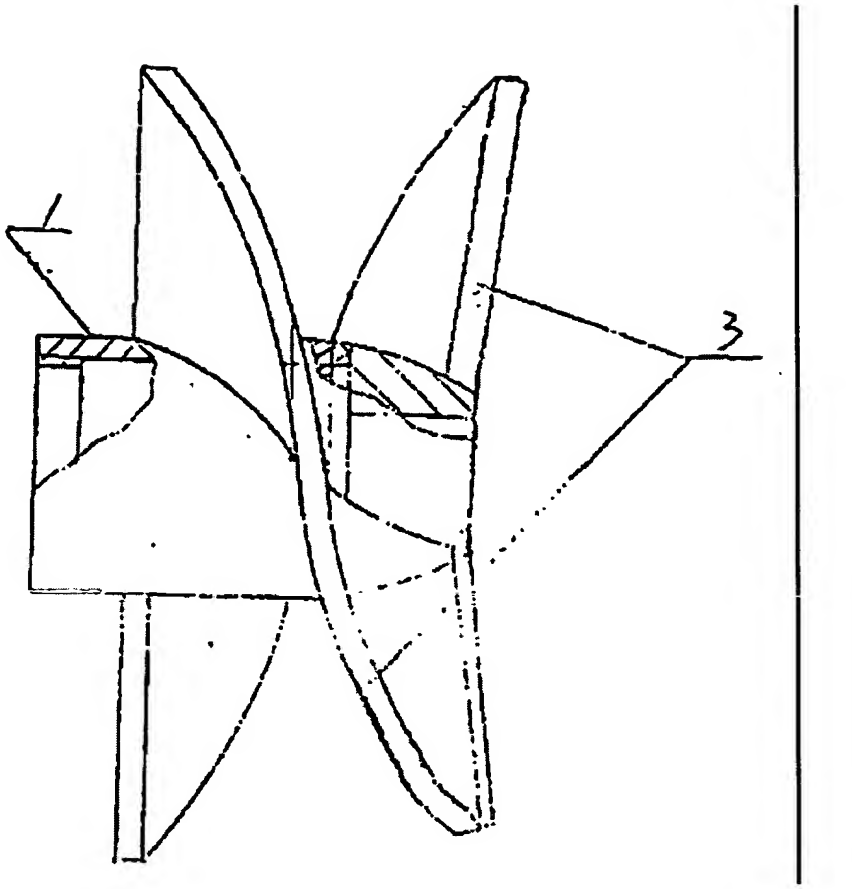

Figure 2

National Intellectual Property Bureau of the People's Republic of China
Postal code: 100032
Investment Plaza Building A 10th Floor, 27 Financial Street, Beijing
Yongxin Patent Trademark Agency
Liu Xingpeng

Sending date:
[stamp]
Patent Bureau
Sent on October 11, 2004

Application No. 031602118
Applicant: Denso K.K.
Title of the invention: Extrusion molding device for ceramic molding product

Notification of the first examination opinion

1. ☒ Upon the request on substantive examination filed by the applicant, according to the stipulation of Article 35 Clause 1 of the Patent Law, the examiner conducts a substantive examination of the patent application for the invention cited above.

   ☐ According to the stipulation of Article 35 Clause 2 of the Patent Law, the National Intellectual Property Bureau conducts a substantive examination of the patent application for the invention cited above on its own initiative.

2. ☒ The applicant requests the following
   Application Date October 1, 2002 with the Patent Office as priority date,
   Application Date _____with Patent Office as priority date,
   Application Date ____ Year ___ Month ___ Day with the Patent Office as priority date,
   Application Date ____ Year ___ Month ___ Day with the Patent Office as priority date,
   Application Date ____ Year ___ Month ___ Day with the Patent Office as priority date.

   ☒ The applicant has submitted the duplicate of the priority application documents filed for the first time and certified by the original application country.

   ☐ The applicant has not submitted the duplicate of the priority application documents filed for the first time and certified by the original application country. According to the stipulation of Article 30 of the Patent Law, it is deemed that the applicant does not submit priority request.

3. ☐ Examination finds that:

____ furnished on ___ Year___ Month___ Day is not in conformity with the stipulation of Article 51 of the implementing regulations.

____ furnished on ___ Year___ Month___ Day is not in conformity with the stipulation of Article 33 of the Patent Law.

____ furnished on ___ Year___ Month___ Day

4. ☒ Examination is conducted with respect to the original application documents.

☐ Examination is conducted with respect to the following application documents.

Claim number ____, specification page___, drawings page ____ of the original application documents furnished on the application date,

Claim number ____, specification page___, drawings page ____ furnished on ___ Year ___ Month ___ Day,

Claim number ____, specification page___, drawings page ____ furnished on ___ Year ___ Month ___ Day,

Claim number ____, specification page___, drawings page ____ furnished on ___ Year ___ Month ___ Day,

Abstract furnished on Year ___ Month ___ Day, Drawings of abstract furnished on Year ___ Month ___ Day.

5. ☐ This notification is prepared without conducting a retrieval.

☒ This notification is prepared after conducting a retrieval.

☒ The comparative references listed below are cited in this notification (the numbers of these references will be used in the future examination process):

No.	Document No. or name	Publication Date (or the application date of conflicting application
1	CN2328499Y	July 14, 1999

6. Conclusive opinion of the examination:

☒ With regard to the specification:

☐ The content of the application falls in the scope of not granting patent right as stipulated in Article 5 of the Patent Law.

☐ The specification is not in conformity with the stipulation of Article 26 Clause 3 of the Patent Law.

☐ The specification is not in conformity with the stipulation of Article 33 of the Patent Law.

☐ Writing of the specification is not in conformity with the stipulation of Article 18 of the implementing regulations.

☒ Figures 16-20 are not in conformity with the stipulation of Article 19 of implementation regulations of the Patent Law.

☒ With regard to Claims:

☐ Claim ___ does not possess the novelty stipulated in Article 22 Clause 2 of the Patent Law.

☒ Claims 1-4 do not possess the inventiveness stipulated in Article 22 Clause 3 of the Patent Law.

☐ Claim ___ does not possess the practical applicability stipulated in Article 22 Clause 4 of the Patent Law.

☐ Claim ___ falls in the scope of not granting patent right as stipulated in Article 25 of the Patent Law.

☐ Claims ____ are not in conformity with the stipulation of Article 26 Clause 4 of the Patent Law.

☐ Claims ___ are not in conformity with the stipulation of Article 31 Clause 1 of the Patent Law.

☐ Claims ____ are not in conformity with the stipulation of Article 33 of the Patent Law.

☐ Claim ____ is not in conformity with the definition of invention specified in Article 2 Clause 1 of the implementing regulations of the Patent Law.

☐ Claim ___ is not in conformity with the stipulation of Article 13 Clause 1 of the implementing regulations of the Patent Law.

☐ Claim ____ is not in conformity with the stipulation of Articles 20 of the implementing regulations of the Patent Law.

☐ Claim ____ is not in conformity with the stipulation of Articles 21 of the implementing regulations of the Patent Law.

☐ Claim ____ is not in conformity with the stipulation of Articles 22 of the implementing regulations of the Patent Law.

☒ Claim 10 is not in conformity with the stipulation of Articles 23 of the implementing regulations of the Patent Law.

☐ ____

The conclusive opinions listed above will be analyzed in detail in the main text of this notification.

7. Based on the conclusive opinions listed above, the examiner believes that:

☐ The applicant should amend the application documents according to the requirements disclosed in the main text of this notification.

☒ The applicant should expound on the reasons the patent application concerned should be granted patent rights in an opinion brief and amend the parts that violate the Patent Law as pointed out in the main text of this notification. Otherwise, no patent rights will be granted.

☐ There is no substantive content that should be granted patent rights in the patent application. If the applicant submits no observation or the observations are not persuasive, the application will be rejected.

☐ ___

8. Applicant should pay attention to the following items:

(1) According to the stipulation of Article 37 of the Patent Law, the applicant should submit his or its observations within four months since the date of receiving this notification. If, without any justified reason, the time limit for making a response is not met, the application shall be deemed to have been withdrawn.

(2) The amendments that the applicant makes to the application should be in conformity with the stipulation of Article 33 of the Patent Law. The amended documents should be prepared in two copies. The format should be in conformity with the concerning regulations in the examination guidelines.

(3) The applicant's response and/or the amended documents should be mailed or delivered to the Receiving Section of the National Intellectual Property Bureau. Any document that is not mailed or delivered to the Receiving Section has no legal validity.

(4) Without an appointment, the applicant and/or agent are not allowed to visit the Patent Office of the National Intellectual Property Bureau to meet with the examiner.

9. The main text of this notification has a total of 2 pages and has the following supplementary documents.

☐ Duplicates of the cited comparative documents Total of ___ copies ___ pages.

Examiner: He Huadong (B204)
September 9, 2004

[stamp]
He Huadong

Examination department Material Examination Department

[footer:]
Please send letter to: Receiving Section of the Patent Office
6 Xitucheng Road, Jimengqiao, Haidian District, Beijing 100088
(Note: Any letter or payment sent to individual examiner is has no legal validity.)

National Intellectual Property Bureau of the People's Republic of China

Main text of the notification of the first examination opinion

Application No. 031602118

The present invention pertains to a type of extrusion molding apparatus for a ceramic molding product. As described in the specification, the technical problem to be solved by the present application is "improving the heterogeneity of the ceramic material by setting different guiding surfaces on the extruding screw." After examination, the examiner makes the following detailed examination observations.

1. The technical scheme disclosed in Claim 1 does not possess the novelty specified in Article 22 Clause 3 of the Patent Law. Comparative document 1 discloses the spiral structure of a type of extruding screw and discloses the following detailed technical features "there are two sections of reamer blades with different screw pitches. There is a diffusion part that faces forward, and there a circumferential space is left between the two groups of reamers" (see the full text of the comparative document). The only difference between the technical scheme disclosed in this claim and the technical content disclosed in the comparative document is that it is required to protect the entire molding device equipped with molding die. However, such difference is a common knowledge. It is obvious to the expert in this technical field that the technical scheme disclosed in this claim can be achieved by combining the aforementioned common knowledge based on the comparative document. Therefore, the technical scheme disclosed in this claim does not possess novelty since it does not possess remarkable substantial characteristics or significant advantages.

2. Claims 2-4 are the dependent claims of Claim 1. The additional technical feature of their specified parts is the various staggering angles along the circumferential direction between the two "guiding parts." This, however, has been disclosed in comparative document 1 (see the full text of comparative document 1). Also, the effect of this technical feature in the comparative

document is the same as that in the present invention. Since Claim 1 cited in these claims does not possess novelty, the aforementioned claims do not possess the novelty specified in Article 22 Clause 3 of the Patent Law, either.

3. Dependent Claim 10 itself is a multi-item dependent claim. Since it cites the previous multi-item dependent claim 9, it is not in conformity with the stipulation of Article 23 Clause 2 of the implementation regulations of the Patent Law. The applicant should amend the citing relationship of this claim.

4. Figures 16-20 of the present invention include unnecessary interpretation of "conventional technology" and are thus not in conformity with the stipulation of Article 19 Clause 4 of the implementation regulations of the Patent Law. The applicant should delete the aforementioned interpretation.

For the reasons described above, the patent application of the present invention cannot be granted a patent on the basis of its current version. The applicant must amend the claims, and, if necessary, make corresponding amendments to the specification. The applicant should also delete the defects in the specification and the figure as pointed out in the main text of this notification. The amendment should be in conformity with the stipulation of Article 33 of the Patent Law without exceeding the scope of the disclosure contained in the initial specification and claims. The applicant should submit the amended claims, specification, and figures by the reply deadline specified in this notification and state the reasons the amended claims possesses novelty compared with the comparative document cited in this notification.

Examiner: He Donghua
Code: B204